

KENT MFG. CORP.

206 CENTER • PRINCETON, N. J.

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J. H. Schrotter
Industry Manager

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206 CENTER
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**flat
conductor
cable
systems**

THE 

*system design
concept...*



KENT MFG. CORP.
206 Center
Princeton, New Jersey
Phone: 609/924-3800

The systems design concept of Kent Mfg. Corp., provides the electronic and electrical circuit designer and packaging engineer the answer to increasingly rigorous electrical, mechanical and environmental specifications. Kent Flat Conductor Cable Systems provide the fastest, most fool-proof, least expensive way to make reliable circuit inter-connections in the following broad fields of application:

Engineers, designers and production experts have realized for years that the cost of wiring and its reliability are not problems inherent in the wire itself. From the cost standpoint it is the labor involved in making connections and installing the cabling. From the reliability standpoint, every electrical connection — crimped, soldered or welded — is a potential source of trouble. The Application Engineers of Kent Mfg. Corp., working in close liaison with customer personnel, utilize all the remarkable advantages of Flat Conductor Cable when developing a system. The Kent "system design concept" produces a complete wiring package that is ready to go into place with all connections and inter-connections accounted for.

To do this, Kent Mfg. Corp. has developed unique techniques described in this brochure. Engineering time is held to a minimum. Extensive experience gives the Kent application engineers a background of practical off-the-shelf pre-designed answers to many situations. Dramatic cost savings, weight and space problems resolved, and time savings are given with actual applications of systems. The "total wiring" approach can help *you* cut costs and, at the same time, give maximum reliability.

KENT
engineers the
complete
wiring package . . .
not just the
parts!

systems
that offer
RELIABILITY
and the LOWEST
INSTALLED COST
. . . from the
most standardized
wiring method
available
today!

Installed Costs reduced as much as 2:1
Weight reduction as much as 10:1
Volume reduced as much as 7:1
Increased current capacity as much as 200%
Over-all package size reduced as much as 60%
Minimum installation time
Elimination of wiring errors
33% to 50% less resistance points
No soldering, welding or crimping
No wire coding necessary
Complete environment protection
Mechanical properties assure long service life
No costly tooling

- Missiles, Rockets and Satellite Systems
- Computers and Business Machines
- Weapons and Defense Systems
- Telephone and Communications Systems
- Instruments and Controls
- Ground Support and Test Equipment
- Airborne Electronics
- Radio and T.V. Equipment
- Home Appliances
- Automated Machine Tools
- Building and Construction Wiring
- Intercom, Signal and Alarm Wiring



space requirements for positioning the magnets.

Details

12 foot long, 90 conductor on 100 mil centers, etched circuitry.
2 — 90 conductor female connectors using Kent strip terminals applied to round wires.
2 — 90 conductor male connectors (conductor used as contact).

To withstand special environmental conditions, Kent connectors can be completely sealed and gasketed, yet still permit disconnection.

Large Ground Support Equipment Manufacturer

■ The leads on a computer for the military required extreme density and had to move thru an 18" travel with little or no force on the drawer. Kent pre-formed and pre-assembled multiple layers of Flat Conductor Cable which acted as a hinge between two matched mounting plates.

A good example of Kent "wiring that moves"! Repeated movement will not affect the strength of Flat Conductor Cable. Pre-forming of multiple layers keeps travel uniform and eliminates force on drawer.

Later Kent developments have made it possible to achieve this same number of terminations with fewer connectors.

The 

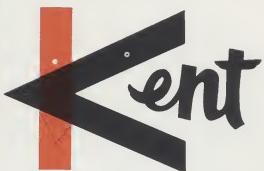
"TOTAL WIRING"
approach

a flexible,
modular series
of sub systems



Send for the recently published catalog K-2, showing Rings, Spades, Hooks, Flags, etc., in Pre-Insulated, non-insulated, insulation support or non-insulation support and insulation piercing types of Kent strip terminals.

SEE THE



FLAT CONDUCTOR CABLE SYSTEM . . .

■ Kent men throughout the country are equipped to show you the Kent Mfg. Corp. system design concept. They will show you some of the outstanding features of this new approach to "TOTAL WIRING".

QC'd all the way



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RELIABILITY

Building Flat Conductor Cable Systems is the Kent application engineer's job. First his materials and second his methods must achieve and maintain reliability at the lowest installed cost. The Kent concept of cabling combines plastics and metals having excellent electrical and mechanical properties . . . with advanced techniques!

FLAT CONDUCTOR

Increased current capacity because of the greater surface area and better heat dissipation give flat conductors a distinct advantage over other conductor shapes. Fully annealed nickel plated copper gives the thin flat conductor excellent electrical characteristics and an almost indestructible flexibility. Extremely precise manufacturing methods produce flat conductors with rolled edges without hairs or burrs, and every conductor is located precisely in relation to each other.

INSULATION

The insulation material is tough, abrasion resistant, high dielectric strength polyester. When lami-

CABLE WIDTH

Kent Flat Conductor Cable Systems have been produced using Flat Conductor Cables up to 10" wide. However, most applications requiring a large number of conductors are best handled by multi-layer or stacking of Flat Conductor Cables.

ELECTRICAL RATINGS

Current carrying capacity is dependent on conductor dimensions, loading and temperature rise permissible. The equivalent of AWG sizes from 12 to 40 allow a line to ground d-c or peak working voltage of 2000 volts. Within given parameters and reasonable temperature rises above ambient, large currents can be handled by various techniques. Kent Application Engineers have experience in the design of specific systems within required electrical rating limits.

MECHANICAL CHARACTERISTICS

As a complete wiring system, Kent Flat Conductor Cable Systems have all the inherent mechanical properties of exceptionally stable materials — with this big "plus" advantage: the complete package



nated and bonded to the conductors it affords complete protection for the multiple conductor circuitry from environmental conditions and as Flat Conductor Cable assumes the superior mechanical properties of high resistance to tension, tearing, abrasion, cracking, flexure and unusual operating configurations. Operating temperatures are from 85°C to 125°C for polyester. Fluorocarbons and other materials are available for higher temperatures.

BONDING

Kent's rigid specifications for Flat Conductor Cables demand a high strength, hermetically sealed lamination with a high-strength bond of the conductors to the polyester or fluorocarbon laminate. In-service stability and resistance to environmental conditions are thereby assured.

CONDUCTOR PITCH

Conductors are spaced on a mil grid system of $\frac{1}{8}$ to $\frac{1}{4}$ or "pitch". This fixed orientation with all other conductors assures uniformity of electrical characteristics across all conductors. Various pitches allow Kent Flat Conductor Cable Systems to match and accept wire wrap components, printed circuit boards and the inter-connection of other devices.

comes ready to install — no costly assembly time! Ease of installation is designed into every system thus eliminating many costly labor hours and reducing the total installed cost.

ENVIRONMENTAL RESISTANCE

Humidity, chemicals, salt or metallic dust do not destroy the insulating or protective properties of Kent Flat Conductor Cables. They are also ideally suited to environments involving severe vibration, shock and great accelerations. Connectors are made of dimensionally stable polycarbonate resin. Complete systems are engineered to operate within given environment.

INTERFERENCE AND SHIELDING

Cabling parameters remain the same from assembly to assembly due to the fixed orientation of conductors. This allows the design use of capacitance and impedance properties of the system. Cross-talk disturbance is minimized because edge-to-edge capacitance between conductors is extremely low. Optimum elimination of cross-talk can be accomplished by grounding selected conductors or adding grounded metallic foil to one or both sides of the Flat Conductor Cable. Many times effective shielding is accomplished by simply placing the cabling next to the metal chassis or cabinet.



KENT TECHNIQUES

the SYSTEM

DESIGN CONCEPT

for

"TOTAL WIRING"

RELIABILITY

and LOW INSTALLED COST

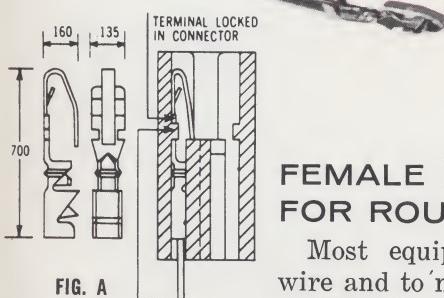


FIG. A

FEMALE RECEPTACLE FOR ROUND WIRE

Most equipment uses round wire and to make the transition to Flat Conductor Cable, Kent has designed a receptacle block to hold leads having especially designed crimped Kent terminals which are firmly locked into precision cavities. (See Fig. A. above) The block is molded of dimensionally stable polycarbonate resin and circuit identification numbers are in the mold. Terminals are gold plated phosphor bronze, providing positive spring contact and long life even with repeated disconnection. Built in polarity key and security lock assure proper alignment and positive holding.

ROUND WIRE TO FLAT
FLAT TO FLAT
FLAT TO ROUND



MALE CONNECTOR FOR FLAT CONDUCTOR CABLE

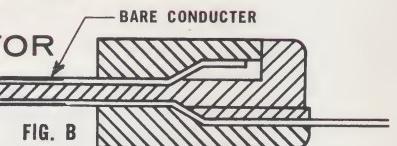


FIG. B

Kent utilizes the conductor itself, which is selectively gold plated, for contact. This eliminates increased resistance points and possible trouble which could be created if crimped, soldered or welded connections were made. The gold plated contact area of the Flat Conductor Cable is folded and locked into the male connector (see Fig. B. above). Conductor blade makes firm contact with female receptacle. Polarity key and security locks provide proper mating. Circuit identification numbers are molded into connector.

Large Computer Control Manufacturer achieved 50% savings on wiring assembly costs alone over former connection method.

■ Kent Flat Conductor Cable Systems were used on tape controlled computers for distilling units. Transition was required from round wire to flat conductor — flat to flat, and flat to printed circuit board, to handle the necessary circuitry, branching circuits and logic circuitry from printed circuit cards.

Each entire sub-assembly was pre-fabricated and supplied with supporting hardware (clips and hangers) ready to install in cabinet. Printed circuit cards were plugged in and System was operative in minutes — the result of Kent application engineers' working closely with customer engineers, using wiring diagrams and working drawings to develop and deliver systems 100% tested and inspected. System check-out or re-work was completely eliminated.

Details

286 feet of 22 conductor Flat Conductor Cable

60 round wire to Flat Conductor connections

307 printed circuit board connectors

6 round wire to flat conductor connectors

7502 contacts made on 100 mil centers! (This was a 3.1 reduction of connections which would have had to be made by old assembly methods.)

The **Kent**

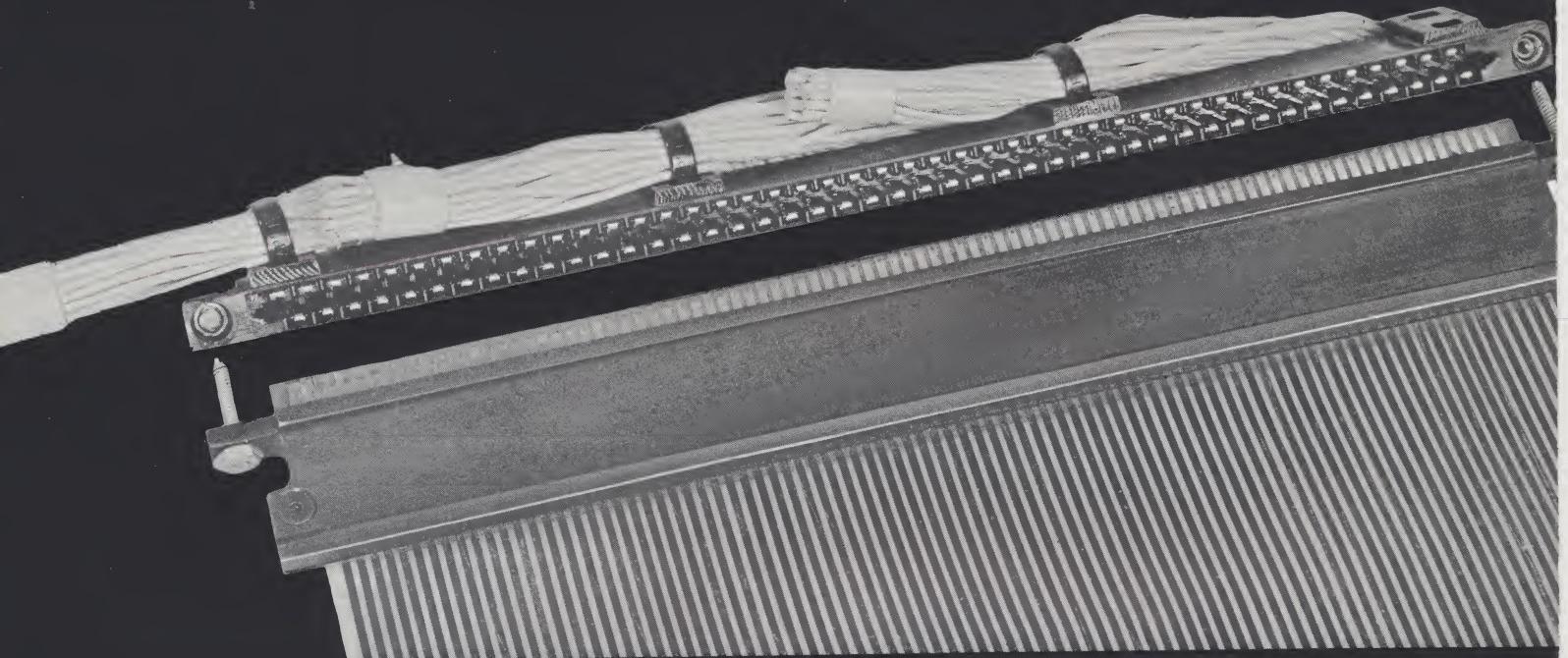
"TOTAL WIRING"

approach

a flexible,
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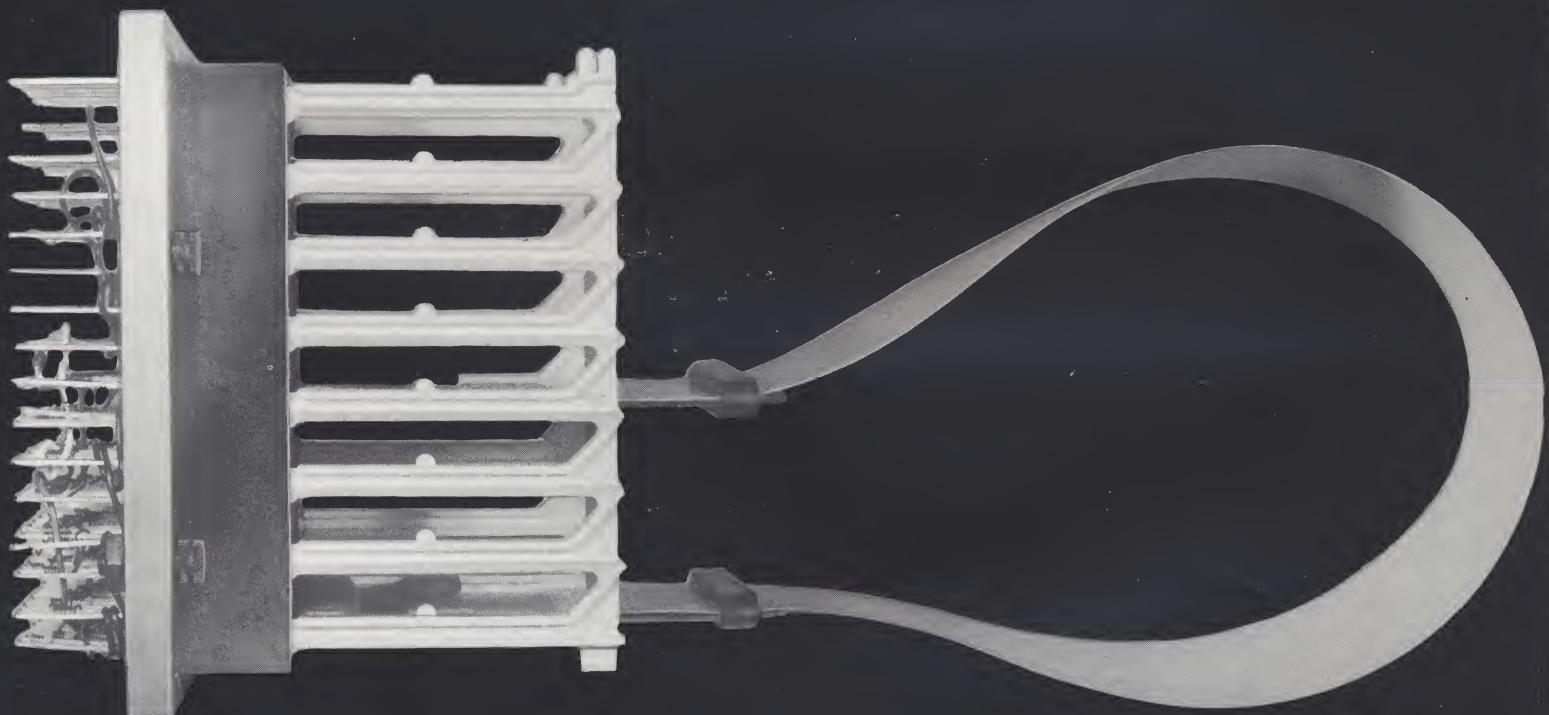
Kent has designed thin nylon supporting clamps or spring clips to hold Flat Conductor Cable. Unique configuration holds straight runs, inside or outside corners.



Large Research Laboratory

■ Kent Application Engineers used the unique Kent method of utilizing the Flat Conductor itself as the contact on this 12' long — 90 conductor etched circuitry. Transition from round to flat and back to round wire was accomplished with slightly modified Kent male and female connectors.

Leads from the correction coils to the magnets of one of the world's largest accelerators were connected simply and quickly without soldering, or other harmful methods, to the etched circuitry. The entire assembly was laminated to the magnets and the small, thin silhouette of the Kent connector housing the contacts did not affect the limited



Large Computer Manufacturer

■ Without re-design of any existing equipment, Kent application engineers were (1) able to increase reliability by eliminating solder connections, (2) reduce costs 3 to 1, (3) save space, (4) have wiring that can safely flex or travel.

Old assembly method used round wire through a strain relief device. Round wire was soldered to a printed board which was then inserted into connector. Many times solder connections required re-work to be reliable.

New method using Kent Flat Conductor Cable System eliminates strain relief parts, soldering of connections and printed circuit boards. Connector is designed to maintain contact performance far exceeding requirements.

The low capacitance of precision oriented conductors in Flat Conductor Cable required no circuitry re-work even though noise level was a critical factor.

Flat Conductor Cable also satisfies requirement of being self-extinguishing.



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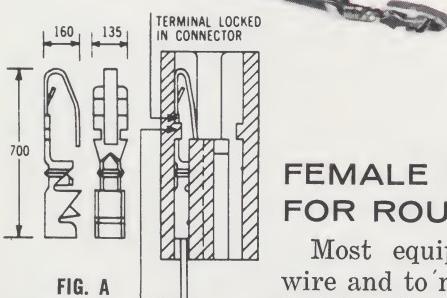
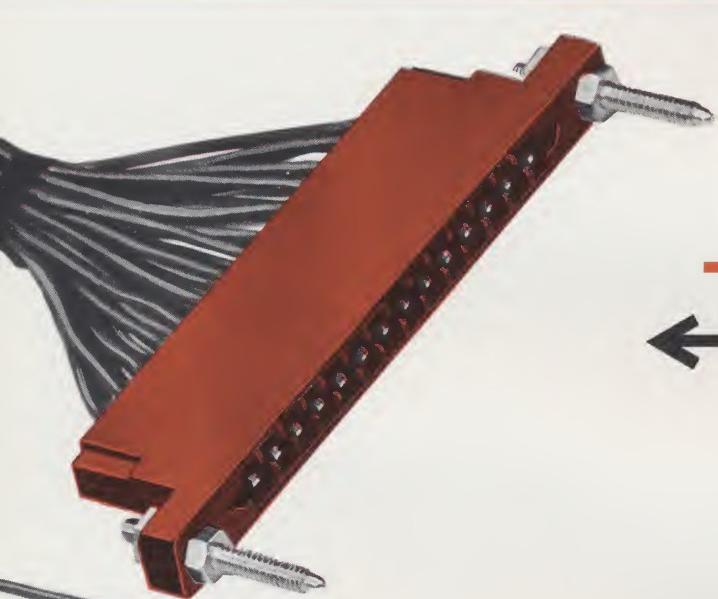
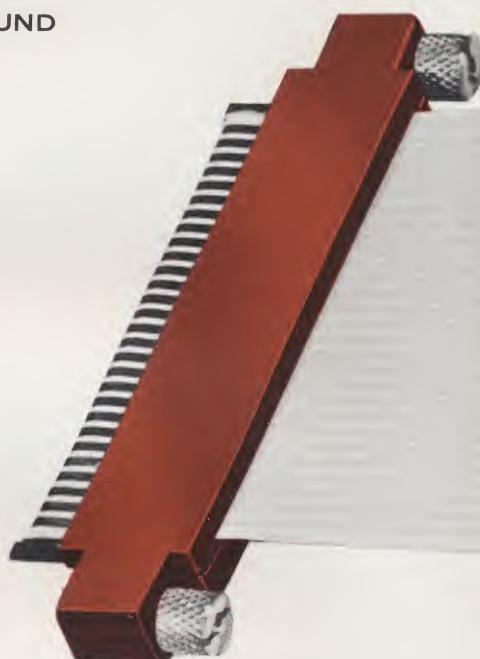


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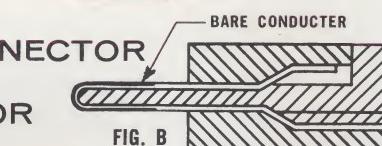


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